

Claims

What is claimed is:

1. A 2D data collection sensor comprising:

an image sensor; and

an illumination module coupled to the image sensor, the illumination module comprising an array of one or more reflectors that reflect light of a light source and collectively generate a uniform illumination pattern both for illuminating a target data area and providing visual aiming assistance.

2. The apparatus in claim 1, wherein each reflector comprises an opaque reflective surface with an aperture formed by the reflective surface, the light source emits light onto the reflective surface and through the aperture onto the target data area, wherein a curvature and shape of the reflective surface determine a shape of the illumination pattern.

3. The apparatus in claim 2, wherein the shape of the reflecting surface is curved for optimal uniformity and sharp edges of the illumination pattern.

4. The apparatus in claim 1, wherein each reflector comprises a transparent solid with a reflective internal surface, light from the light source enters the solid, is reflected by the reflective surface and exits through the solid onto the target data area, wherein a curvature and a shape of the reflective surface produces a shape of the illumination pattern.

5. The apparatus in claim 4, wherein a curvature in the reflective surface optimizes the uniformity and sharp edges of the illumination pattern.

6. The apparatus in claim 2, wherein the light source comprises an LED.

7. A 2D imaging barcode reader comprising:

an image sensor; and

an illumination module coupled to the image sensor, the illumination module comprising an array of one or more reflectors that reflect light of a light source and collectively generate a uniform illumination pattern both for illuminating a target data area and providing visual aiming assistance for a target barcode.

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8. The apparatus in claim 7, wherein each reflector comprises an opaque reflective surface with an aperture formed by the reflective surface, the light source emits light onto the reflective surface and through the aperture onto the target data area, wherein a curvature and shape of the reflective surface determine a shape of the illumination pattern.

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9. The apparatus in claim 8, wherein the shape of the reflective surface is curved for optimal uniformity and sharp edges of the illumination pattern.

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10. The apparatus in claim 7, wherein each reflector comprises a transparent solid with a reflective internal surface, light from the light source enters the solid, is reflected by the reflective surface and exits through the solid onto the target area, wherein a curvature and a shape of the reflective surface produces a shape of the illumination pattern.

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11. The apparatus in claim 10, wherein a curvature in the reflective surface optimizes the uniformity and sharp edges of the illumination pattern.

12. The apparatus in claim 8, wherein the light source comprises an LED.

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13. A 2D data collection illumination pattern for a data collection image sensor, the illumination pattern comprising a shape and uniformity generated by an array of reflectors coupled to the data collection image sensor, wherein the reflectors reflect light from a light source.

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14. A method for 2D data collection comprising:

projecting an illumination pattern on a target image area, the illumination pattern comprising a shape and uniformity generated by an array of reflectors coupled to a data collection image sensor, wherein the reflectors reflect light from a light source, and wherein the illumination pattern provides both image illumination and visual aiming assistance; and

reading data from the target image area via an image sensor.

15. A method for 2D barcode data collection comprising:

projecting an illumination pattern on a target barcode area, the illumination pattern comprising a shape and uniformity generated by an array of reflectors coupled to a data collection image sensor, wherein the reflectors reflect light from a light source, and wherein the illumination pattern provides both image illumination and visual aiming assistance; and

reading data from the target barcode area via an image sensor.